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STEPHEN H. CAGLE HOWREY, SIMON, ARNOLD & WHITE, LLP 750 BERING DRIVE HOUSTON, TX 77057			RIDLEY, BASIA ANNA	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/023,313

Applicant(s)

KRAUSE ET AL.

Examiner

Basia Ridley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>051502.072902</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Priority*

1. It is noted that this application appears to claim subject matter disclosed in prior Application No. 60/255,348, filed 13 December 2000. A reference to the prior application must be inserted as the first sentence(s) of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e) or 120. See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. Also, the current status of all nonprovisional parent applications referenced should be included.

If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period

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may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

### *Specification*

2. The disclosure is objected to because of the following informalities:

- inconsistent numbering of elements: e.g. "feed stream F" (see P6/L3, P10/L9, P12/L8, P14/L21, P14/L27) and "process stem F" (see P9/L10, P9/L16, P12/L14);
- "a hydrogen rich gas" on P10/L15 should be amended to --a hydrogen rich gas P--; and
- "the third exchanger 304" on P13/L22 should be amended to --the third exchanger 306--.

Appropriate correction is required. Applicant is reminded that no new matter shall be added.

3. The use of the trademark Inconel, has been noted in this application (see P4/L9 and P16/L27). It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

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### ***Drawings***

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because the following reference characters have been used to designate more than one detail:

- "F" has been used to designate both, feed stream (in Fig. 1) and a process step (in Fig. 1);

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

5. Claims 8-17 are objected to because of the following informalities:

- in claim 8, "zone.; and" should be replaced with --zone; and--.

Appropriate correction is required. Applicant is reminded that no new matter shall be added.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the

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invention.

Claim 17 contains the trademark/trade names Inconel . Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a perforated plate and, accordingly, the identification/description is indefinite.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 6-8, 11-12 and 14-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Clawson (WO 98/08771).

Regarding claims 1 and 6-7, Clawson in Fig. 1 discloses a compact fuel processor for converting a hydrocarbon fuel feed to hydrogen rich gas, comprising:

- a cylinder (12) having an inlet end (16) and an outlet end (14); wherein

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- the cylinder is loaded with a plurality of catalysts (e.g. 28, 66, 84) in series fashion thus forming a series of reaction zones (e.g. 26, 64, 71, 76); and
- a heat exchanger (e.g. 32, 40) having an inlet end (33) and an outlet end (20), wherein the heat exchanger is internally positioned through the length of the cylinder so as to provide heat or remove heat as required by a particular reaction zone (Fig. 1); wherein
- the inlet end of the heat exchanger (33) is at the outlet end of the cylinder (14); and
- the cylinder (12) is oriented substantially vertically with the outlet end (14) of the cylinder (12) being on top (Fig. 1).

Regarding claims 8, 11-12 and 14-15, Clawson in Fig. 1 discloses a compact fuel processor for converting a hydrocarbon fuel feed to hydrogen rich gas, comprising:

- a reaction chamber (12);
- a plurality of predefined reaction zones (e.g. 26, 64, 71, 76) within said reaction chamber (12), wherein each reaction zone is characterized by the chemical reaction that takes place within the reaction zone; and
- a heat exchanger (e.g. 32, 40) having an inlet end (33) and an outlet end (20), wherein the heat exchanger is positioned within the reaction chamber (12); wherein
- wherein each reaction zone of the plurality of reaction zones (e.g. 26, 64, 71, 76) may contain one or more catalysts selected from the group consisting of autothermal reforming catalyst, desulfurization catalyst, water gas shift catalyst, and preferential oxidation catalyst (P6/L21-P11/L5);
- a reaction zone (64, 71) containing more than one catalyst (66 and P9/L16-20) is separated from an adjacent reaction zone (76) and is supported by a permeable plate (68).

Regarding limitations recited in claims 11 and 12 which are directed to a manner of

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operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

10. Claims 1-5, 7-12 and 14-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Krause et al. (US 2002/0094310).

Regarding claims 1-5, 7-12 and 14-17, Krause et al. in Fig. 2 discloses all of the claim limitations.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e).

This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

11. Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Desphande (US 6,824,577).

Regarding claims 1-14, Desphande'577 in Fig. 2 discloses all of the claim limitations.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e).

This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this



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application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

12. Claims 1, 8, 11-12 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Desphande (US 2002/0090327).

Regarding claims 1, 8, 11-12 and 14, Desphande’327 in Fig. 2 discloses all of the claim limitations.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

13. Claims 1, 8, 11-12 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Desphande et al. (US 2002/0083646).

Regarding claims 1, 8, 11-12 and 14, Desphande et al.’646 in Fig. 2 discloses all of the claim limitations.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clawson (WO 98/08771), as applied to claim 15 above.

Regarding claims 16-17 Clawson discloses all of the claim limitations as set forth above.

Additionally the reference discloses the fuel processor wherein:

- the plate is selected from the group consisting of perforated metal, metal screen, metal mesh, sintered metal and porous ceramic (P13/L8).

While the reference does not explicitly disclose the plate being made from metal such as Inconel, carbon steel and stainless steel, since no specific materials of construction of the plate are disclosed in said reference(s), and, since the instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the gas conduit from metal such as Inconel, carbon steel and stainless steel because such metals are routinely used as reactor construction materials due to their resistance to heat and corrosion.

16. Claims 2-5, 9-10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clawson (WO 98/08771), as applied to claim 1 above in view of Lesieur (WO 00/72954) and Skala et al. (EP 977,293).

Regarding claim 2 Clawson discloses all of the claim limitations as set forth above.

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Additionally the reference discloses the fuel processor wherein:

- the plurality of catalysts comprises desulfurization catalyst (P9/L16-20), water gas shift catalyst (66, 84) and wherein the fuel processor further includes a partial oxidation and reforming zone (18).

The reference discloses that the objective of disclosed fuel processor is to process variety of fuel sources into hydrogen to be used for powering fuel cells and to provide processor that is more compact and highly integrated to allow for use in a vehicle (P2/L1-9). Additionally the reference teaches that disclosed embodiment lowers carbon monoxide in product gas to less than 1% (P14/L19-21). The reference does not explicitly disclose the plurality of catalyst further comprising autothermal reforming catalyst and preferential oxidation catalyst.

Lesieur teaches a fuel processor which can be used on board of vehicles to provide hydrogen for a fuel cell which by using autothermal catalyst can process hydrocarbons which are more difficult to reform (P1/L35-P2-L8 and P2/L34-P3/L2).

It would have been obvious to one having ordinary skill in the art at the time of the invention to use replace the partial oxidation and reforming zone of the fuel processor of Clawson with autothermal catalyst zone, as taught by Lesieur, for the purpose of allowing use of hydrocarbons which are more difficult to reform in highly compact manner.

Skala et al. teaches that while shift reaction is often used to reduce carbon monoxide content of product gas to be supplied to the fuel cell, some CO still survives and needs to be reduced to below about 20 ppm before said product gas can be supplied to fuel cell ([0006]). The reference also teaches that for vehicular applications production of gas for fuel cell has to be carried out as efficiently and in the most compact space possible ([0007]) and this can be accomplished by adding preferential oxidation catalyst zone to the fuel processor vessel (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time of the

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invention to add preferential oxidation catalyst zone after the low temperature shift reaction zone in the fuel processor of Clawson, as taught by Skala et al., for the purpose of further lowering carbon monoxide content of the product gas in efficient manner and in the most compact space possible.

Regarding claim 3, Clawson in view of Lesieur and Skala et al. disclose all of the claim limitations as set forth above. Additionally, Clawson discloses the fuel processor wherein

- the heat exchanger is not positioned within the partial oxidation and reforming zone (Fig. 1).

Regarding limitations recited in claims 4-5 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

Regarding claims 9 and 13 Clawson discloses all of the claim limitations as set forth above. Additionally the reference discloses the fuel processor wherein:

- a first reaction zone contains a partial oxidation and reforming zone (18), a second reaction zone (64, 71) contains desulfurization catalyst (P9/L16-20) and a third reaction zone (76) contains water gas shift catalyst (84);
- the inlet end (33) of the heat exchanger (32) is at the last reaction zone (Fig. 1) and the outlet end (20) is at the second reaction zone (64, 71).

The reference discloses that the objective of disclosed fuel processor is to process variety of fuel sources into hydrogen to be used for powering fuel cells and to provide processor that is more compact and highly integrated to allow for use in a vehicle (P2/L1-9). Additionally the reference

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teaches that disclosed embodiment lowers carbon monoxide in product gas to less than 1% (P14/L19-21). The reference does not explicitly disclose the first reaction zone containing autothermal catalyst and a reaction zone containing preferential oxidation catalyst.

Lesieur teaches a fuel processor which can be used on board of vehicles to provide hydrogen for a fuel cell which by using autothermal catalyst can process hydrocarbons which are more difficult to reform (P1/L35-P2-L8 and P2/L34-P3/L2).

It would have been obvious to one having ordinary skill in the art at the time of the invention to use replace the partial oxidation and reforming zone of the fuel processor of Clawson with autothermal catalyst zone, as taught by Lesieur, for the purpose of allowing use of hydrocarbons which are more difficult to reform in highly compact manner.

Skala et al. teaches that while shift reaction is often used to reduce carbon monoxide content of product gas to be supplied to the fuel cell, some CO still survives and needs to be reduced to below about 20 ppm before said product gas can be supplied to fuel cell ([0006]). The reference also teaches that for vehicular applications production of gas for fuel cell has to be carried out as efficiently and in the most compact space possible ([0007]) and this can be accomplished by adding preferential oxidation catalyst zone to the fuel processor vessel (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time of the invention to add preferential oxidation catalyst zone after the low temperature shift reaction zone in the fuel processor of Clawson (making it the last, fourth zone), as taught by Skala et al., for the purpose of further lowering carbon monoxide content of the product gas in efficient manner and in the most compact space possible.

Regarding claim 10, Clawson in view of Lesieur and Skala et al. disclose all of the claim limitations as set forth above. Additionally, Clawson discloses the fuel processor wherein

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- the heat exchanger is not positioned within the first reaction zone (18).

17. Claims 6 and 13 are rejected under 35 U.S.C. 103(a) as being obvious over Krause et al. (US 2002/0094310).

Krause et al. discloses all of the claim limitations as set forth above. While Krause et al. discloses number of heat exchangers for various of recited reaction zones, the reference does not explicitly disclose said heat exchangers being connected into one heat exchanger. As instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to connect the various heat exchangers of Krause et al., since such modification would have involved making elements integral. Making elements integral is generally recognized as being within the level of ordinary skill in the art. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965). Further, one of ordinary skill in the art would have been led by the applied references to forgo use of separate heat exchanger, along with their function and benefit, where doing so is technically feasible and would reduce cost. See *In re Thompson*, 545 F.2d 1290, 1229, 188 USPQ 365, 367 (CCPA 1976).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior

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inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR

1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

18. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being obvious over Desphande (US 2002/0090328) in view of Bentley et al. (WO 99/36351).

Desphande'328 discloses all of the claim limitations as set forth above, but the reference does not disclose porous metal plates supporting the various catalysts.

Bentley et al. discloses an alternative design for a fuel processor where use of porous metal plates supporting various catalysts allows for diverging flow or process stream and therefore allows for lower pressure and reduces parasitic requirements of the reactor, increases reactor throughput and improves reactor operation (P4/L27-P6/L2).

It would have been obvious to one having ordinary skill in the art at the time of the invention to redesign the reactor of Desphande'328 as taught by Bentley et al. for the purpose of reducing parasitic requirements of the reactor, increasing reactor throughput and improving reactor operation.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not

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claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

19. Claims 2-7, 9-10 and 13 are rejected under 35 U.S.C. 103(a) as being obvious over Desphande (US 2002/0090327).

Desphande'327 discloses all of the claim limitations as set forth above. While Desphande'327 discloses two reactor stacks and a number of heat exchangers for various of recited reaction zones, the reference does not explicitly recite a said heat exchangers being connected into one heat exchanger and all reaction zones being contained in one cylindrical vessel. As instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to connect the various heat exchangers of Desphande'327 and to combine all of the reaction zones into one cylindrical vessel, since such modification would have involved making elements integral. Making elements integral is generally recognized as being within the level of ordinary skill in the art. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965). Further, one of ordinary skill in the art would have been led by the applied references to forgo use of separate heat exchangers and separate reaction stacks, along with their function and benefit, where doing so is technically feasible and would reduce cost. See *In re Thompson*, 545 F.2d 1290, 1229, 188 USPQ 365, 367 (CCPA 1976).



The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

20. Claims 2-7, 9-10 and 13 are rejected under 35 U.S.C. 103(a) as being obvious over Desphande et al. (US 2002/0083646).

Desphande'646 discloses all of the claim limitations as set forth above. While Desphande et al.'646 discloses two reactor stacks and a number of heat exchangers for various of recited reaction zones, the reference does not explicitly recite a said heat exchangers being connected into one heat exchanger and all reaction zones being contained in one cylindrical vessel. As instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to connect the various heat exchangers of Desphande et al.'646 and to combine all of the reaction zones into one cylindrical vessel, since such modification would have

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involved making elements integral. Making elements integral is generally recognized as being within the level of ordinary skill in the art. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965). Further, one of ordinary skill in the art would have been led by the applied references to forgo use of separate heat exchangers and separate reaction stacks, along with their function and benefit, where doing so is technically feasible and would reduce cost. See *In re Thompson*, 545 F.2d 1290, 1229, 188 USPQ 365, 367 (CCPA 1976).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

### ***Double Patenting***

21. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible

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harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

22. Claims 1-17 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of copending Application No.

10/006,963. Although the conflicting claims are not identical, they are not patentably distinct from each other because said claims 1-17 of the instant application recite only the limitations which are recited in claims 1-30 of copending Application No. 10/006,963. While claims 1-30 of copending Application No. 10/006,963 recite number of heat exchangers for various of recited reaction zones, they do not explicitly recite a said heat exchangers being connected into one heat exchanger. As instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to connect the various heat exchangers recited in claims 1-30 of copending Application No. 10/006,963, since such modification would have involved making elements integral. Making elements integral is generally recognized as being within the level of ordinary skill in the art. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965). Further, one of ordinary skill in the art would have been led by the applied references to forgo use of separate heat exchangers, along with their function and benefit, where doing so is technically feasible and would reduce cost. See *In re Thompson*, 545 F.2d 1290, 1229, 188 USPQ 365, 367 (CCPA 1976).

This is a provisional obviousness-type double patenting rejection because the conflicting

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claims have not in fact been patented.

23. Claims 1-14 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 6,824,577. Although the conflicting claims are not identical, they are not patentably distinct from each other because said claims 1-14 of the instant application recite only the limitations which are recited in claims 1-21 of U.S. Patent No. 6,824,577.

24. Claims 15-17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 6,824,577 in view of Bently et al. (WO 99/36351). Although the conflicting claims are not identical, they are not patentably distinct from each other because said claims 15-17 of the instant application recite only the limitations which are recited in claims 1-21 of U.S. Patent No. 6,824,577 except for reciting porous metal plates supporting the various catalysts.

Bently et al. discloses an alternative design for a fuel processor where use of porous metal plates supporting various catalysts allows for diverging flow or process stream and therefore allows for lower pressure and reduces parasitic requirements of the reactor, increases reactor throughput and improves reactor operation (P4/L27-P6/L2).

It would have been obvious to one having ordinary skill in the art at the time of the invention to redesign the reactor recited in claims 1-21 of U.S. Patent No. 6,824,577 as taught by Bently et al. for the purpose of reducing parasitic requirements of the reactor, increasing reactor throughput and improving reactor operation.

25. Claims 1-14 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24 of copending Application No. 10/021,673. Although the conflicting claims are not identical, they are not patentably distinct from

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each other because said claims 1-14 of the instant application recite only the limitations which are recited in claims 1-24 of copending Application No. 10/021,673. While claims 1-24 of copending Application No. 10/021,673 recite two reactor stacks and a number of heat exchangers for various of recited reaction zones, they do not explicitly recite a said heat exchangers being connected into one heat exchanger and all reaction zones being contained in one cylindrical vessel. As instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to connect the various heat exchangers recited in claims 1-24 of copending Application No. 10/021,673 and to combine all of the reaction zones into one cylindrical vessel, since such modification would have involved making elements integral. Making elements integral is generally recognized as being within the level of ordinary skill in the art. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965). Further, one of ordinary skill in the art would have been led by the applied references to forgo use of separate heat exchangers and separate reaction stacks, along with their function and benefit, where doing so is technically feasible and would reduce cost. See *In re Thompson*, 545 F.2d 1290, 1229, 188 USPQ 365, 367 (CCPA 1976).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

26. In view of the foregoing, none of the claims are allowed.
27. The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 1764.
28. Any inquiry concerning this communication or earlier communications from the examiner

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should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).



Basia Ridley  
Examiner  
Art Unit 1764

BR

March 20, 2005